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Greening Non-Profit Residential Construction: An Analysis of Habitat for Humanity in Mississippi

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Greening Non-Profit Residential Construction: An Analysis of Habitat for Humanity in Mississippi

by

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Abstract

Poverty affects housing quality which in turn affects occupant health, and Mississippi (MS) has been identified as the state with one of the highest poverty rates. Voluntary support offered by Non-Profit Organization (NPO) serves to aid populations experiencing inadequate housing conditions. Given the need to create adequate housing for low-income families, it can be probable that green building strategies fall low on the list of NPO priorities. Thus, this research aims to identify the trends of a major NPO operating in MS, which also adopts green housing. The researcher also identified the aspects for NPO affiliates that set the adopters of green housing apart from the non-adopters? Combined design strategy was utilized with two phases built in it. The first phase utilized explorative design methodology and led to identification of the NPO which met all pre-established criterion. The selected NPO (Habitat for Humanity [HFH]) was analyzed in the second phase utilizing cross-sectional design. Telephonic survey was used as the method for data collection. It was found that HFH in MS had 38 affiliates, and three out of 38 affiliates were able to provide green certified housing. The study found an uneven distribution of HFH affiliates across the state. The study also identified that the presence of chain agent was imperative within the affiliates for adoption of green housing. Further, the research identified cost, accessibility to green materials, and affordability for families as major barriers for adoption of green housing. The researcher identified that routinization of green innovations does occur within green housing and was based on experience of the builder. Routinization of green innovation within NPOs in Mississippi was obtained after completing five to ten projects.

Key Words: Non-Profit Organizations, Habitat for Humanity International, Routinization

Dedication

To my friends, family, and mentors—Mom, Dad, Adam, Ann Marie Chilcutt, Kami Mueller, Paula Mathis, Dr. Weinauer, Miranda Grieder, and Dr. Davis.
Thank you for your unrivaled support, encouragement, and persistence in pushing me to the very best of my abilities. I could not have asked for a better support system than that which you all provided me.

To my thesis advisor, Dr. Sandeep Langar—words do not seem sufficient to show my thanks. The sleepless nights of editing, the hard work of research, and the hassle of putting up with my ignorance have all been more than appreciated. Without your help and supervision, this project would not have found its completion. Thank you for pushing me and inspiring me to go above and beyond requirements to deliver my true best.

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List of Abbreviations

ERS- Economic Research Service

HFHI- Habitat for Humanity International

HFH- Habitat for Humanity

IRB- Institutional Review Board

NCCP- National Center for Children in Poverty

NPC- National Poverty Center

NPO- Non-profit organization

USCB- United States Census Bureau

USDA- United States Department of Agriculture

WBCSD- World Business Council on Sustainable Development

WCED- World Commission on Environment and Development

Chapter 1 - Introduction

The national poverty rate in the United States for 2012 was found to be 15% and accounted for 46.5 million people (United States Census Bureau [USCB], 2013). Over the past two decades, this has been the highest poverty rate documented (National Poverty Center [NPC], 2014). In addition, about 11% of all counties across the nation, accounting for 353 counties total, were found to be *persistently poor* (USDA ERS, 2014). USDA Economic Research Service (ERS) defines persistent poverty as *"20 % or more of the county's populations living in poverty for over the last 30 years."* Figure 1.1 represents the distribution of the persistent poverty counties across the country.

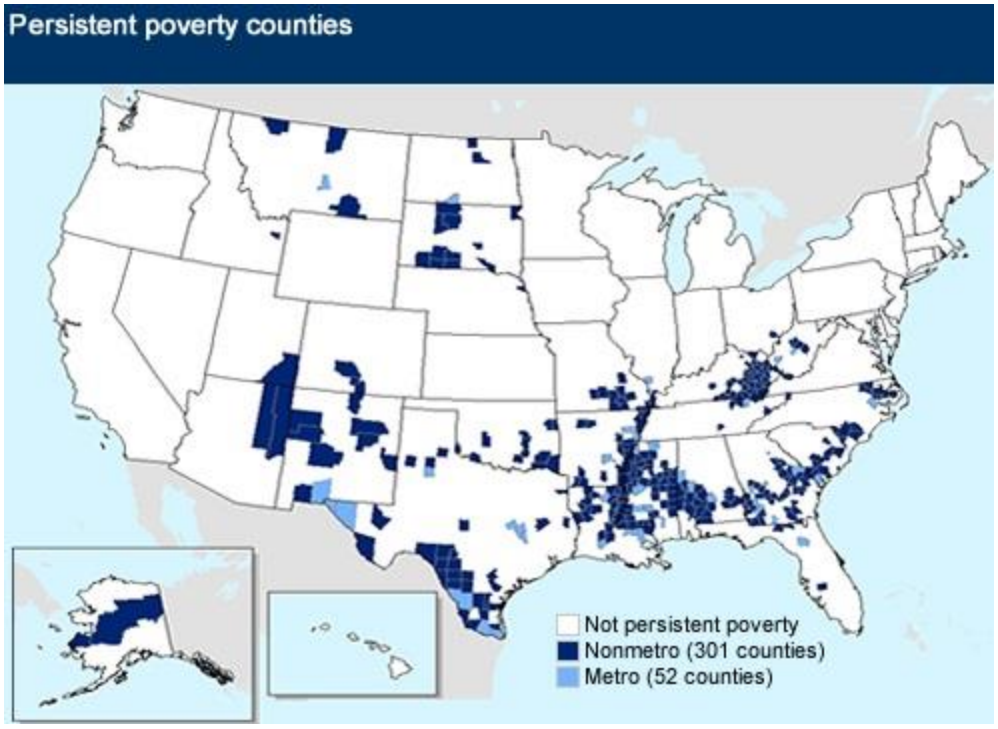


Figure 1.1. Distribution of the persistent poverty counties across the country

(Source: USDA ERS, 2014)

It can be observed that the majority of such counties experiencing persistent poverty are

distributed along the Southern United States. On further analysis of the data compiled by USDA ERS (2014), the researcher found that the State of Mississippi represented the maximum number (about 14%) of *persistently poor* counties. Mississippi has 82 counties (SOS, 2014), and 50 of those counties (about 61%) are listed as *persistently poor* counties as per the USDA ERS (2014). Thereby, such statistics indicate that the majority of Mississippi counties have had one-fifth of the population living under the poverty line for the past three decades. Furthermore, the literature review also indicated that the state had about 24% of its population living below the poverty line in 2012 and an unemployment rate of about nine percent in 2013. In addition, research shows that Mississippi (along with the District of Columbia) had the highest percentage of children living in poverty in 2012 (National Center for Children in Poverty [NCCP], 2012). Thus, based on the evidence provided by the agencies, there are indications that the majority of counties in Mississippi have been facing economic hardships and poverty for the past three decades.

Poverty impacts multiple aspects of society, such as poor housing quality, lack of safe environment, lower job opportunities, and others (ISS, 2014). Poor housing quality has been found to impact the physical, psychological, and emotional health of the occupants (Krieger and Higgins, 2002) and has been found to have more detrimental impacts on younger generations.

Residents in the state experiencing inadequate housing conditions create a need for providing adequate and humane housing environments. Voluntary support offered by Non-Profit Organizations (NPOs) serves to aid populations experiencing inadequate housing conditions. Walker (1993) also points out that the conditions under which NPOs operate are also getting more severe. For example, lower affordability of housing,

increased poverty in masses, and reduced access to credit serve as examples of digression in NPO operation environments. Thus, given the problems encountered by NPOs and the need to create adequate housing for a segment of the population in the state, it can be probable that green building strategies and long-term concerns for the environmental impacts of a project fall low on the list of NPO priorities. In other words, the "triple bottom line" is made up of social, economic, and environmental factors; NPOs have a tendency to prioritize social and economic factors above environmental or *green* incentives (Drexhage and Murphy, 2010). In addition, there have been instances when researchers have found initial costs of green buildings to be more in comparison to traditional facility (Federal Bank of St. Louis, 2008; Tellus Institute, 2003; Walker, 1993). Thus, when there is a stronger perception that the green buildings cost more, then there is a probability that the NPOs might not be focusing on the construction of green housing. Other barriers found and identified within literature for green affordable housing are: short ownership for the developer and exemption from operational savings, coordination of multiple funding sources, perceived risk, increased regulatory and contracting burdens, and limited experience in building green projects (Federal Bank of St. Louis, 2008; Tellus Institute, 2003). However, benefits of green housing cannot be ignored with direct impacts on improved indoor environmental quality, reduced operating costs, which in turn lowers life cycle costs for the owner (energy and water), and reduced impacts on ecology (Global Green). The benefits from improved indoor environmental quality and lower utility/operating costs directly benefit the occupants. Lower utility costs over the lifecycle make the green units affordable, even though they might have a high initial/upfront cost (Federal Bank of St. Louis, 2008). In addition, The National

Resources Defense Council [NRDC] (2006) argues that the traditional homes can potentially cost owners more than green homes over the lifecycle of the occupancy. The increased costs (direct and indirect) can be caused by a poor ventilation system, the use of toxic materials that cause negative health impacts on the occupants, an inefficient envelope that results in higher utility bills and higher spending, and a sprawl impacting the budget of the occupant(s) (NRDC, 2006). The lifecycle cost for the unit becomes more important for people who are facing economic hardships and cannot afford better housing. Thus, it can be safe to state that not only is it important to provide housing for people facing economic hardship, but also to ensure that the houses improve the well-being of the occupants by providing an environment where the occupants feel physically, financially, and emotionally healthy.

Chapter 2 - Literature Review

2.1 Sustainable development

Brundtland report defines sustainable development as "… *development which meets the needs of the present without compromising the ability of future generations to meet their own needs*" (Drexhage and Murphy, 2010). This definition has gained credibility and "*political salience*" after its acceptance by the United Nations General Assembly in 1992 and has become the most commonly used definition for sustainable development (Drexhage and Murphy, 2010). Sustainability is viewed as a three-pronged concept, consisting of economic development, social equity, and environmental responsibility and protection (Drexhage and Murphy, 2010). Over the past 20 years or so, sustainability and environmental responsibility and protection have been used interchangeably (Drexhage and Murphy, 2010). However, environmental impetus is only a piece of sustainability's definition. In addition, sustainability aims at focusing on the needs of social, economic, *and* environmental concerns. The need for sustainable development comes from the growing human impacts, especially the built environment, on the resources of the planet (Keysar and Pearce, 2007; Kibert et al., 2002; Langar, 2013; State of the Environment Report [SoE], 2011; World Wildlife Fund [WWF], 2012). It is estimated that the buildings in the United States were responsible for 72% of total U.S. electricity consumption in 2006, which is expected to rise to 75% by 2025. Buildings also are responsible for 13% of the total water consumed, 40% of non-industrial solid waste generated, 49% of SO2 emissions, and 38.9% of CO2 emissions (Environmental Protection Agency [EPA], 2009; Keysar and Pearce, 2007; Langar, 2013; Office of the Federal Environmental Executive [OFEE], 2003). Thus, with these negative

impacts of buildings on the planet, it is imperative that there is a transition towards development that is sustainable for a continued period of time so that the future generations are able to meet the needs and requirements. In this process, societies need to transition towards buildings (including houses) that demonstrate more resource efficiency, offer better indoor environmental quality to the occupants, respond to the surroundings, and maintain a symbiotic relationship with the surrounding community. This process would ensure that the buildings are green or environmentally friendly/ecologically responsive.

2.2 Green housing and certification

In 2011 the residential construction sector accounted for about 18% of all energy used in the U.S. (US EIA, 2014). Homes that significantly reduce the consumption of resources (water, energy, and materials) and have improved indoor air quality can be considered as green. Based on *Modern Sustainable Residential Design*, there are nine basic considerations involved in the green building process: climate zone, placement on site, orientation, foundations, insulation, exterior finishes, roofs, windows and doors, and systems compatibility (Carpenter, 2009).

Despite the potential impact on the environment, energy consumption, and improved indoor air quality of the home, green housing was slow to gain higher adoption rates as of 2007 (Scheuer, 2007). A lack of clear distinction of both definition and benefits resulting from green housing is thought to be a predominant cause in adoption's slow infiltration into the residential construction sector. The inconsistency in valuation and definition of green housing and green building standards is still a relevant issue even

to the industry today (Scheuer, 2007). Thus, variations in valuations, definitions, and benefits can have a substantial restrictive impact on green housing adoption.

Dr. Scheuer from the University of Michigan suggests that part of the adoption hesitancy stems from a misunderstood assumption that learning green building knowledge is a straightforward process containing a fixed goal. However, the beginning line and the targeted finish is unknown and anything but fixed (Scheuer, 2007).

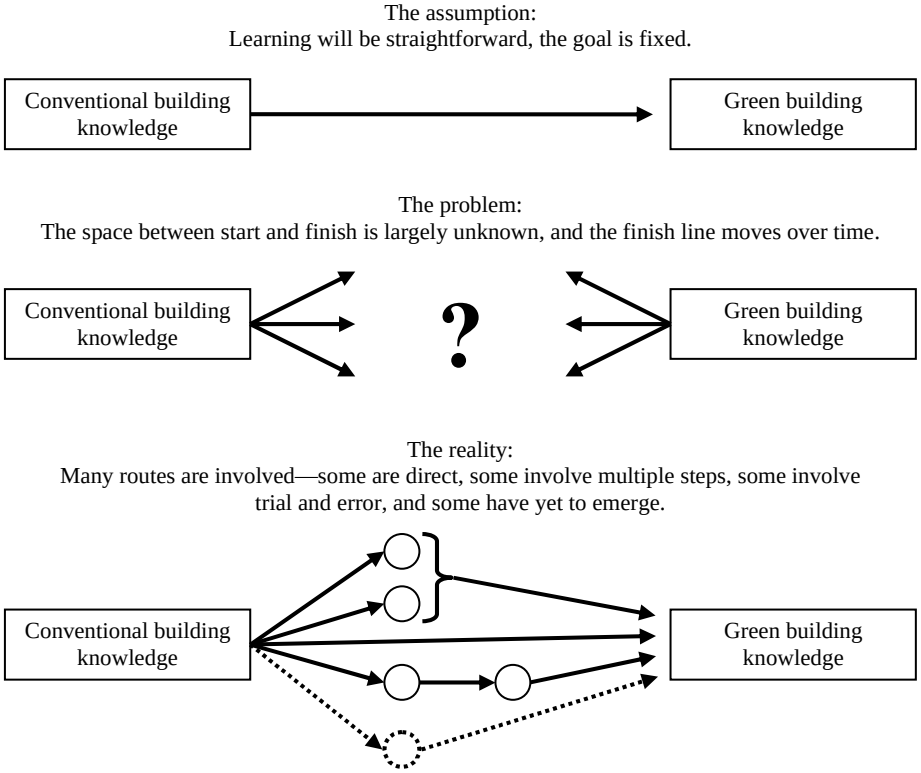


Figure 2.1. Learning about green building is neither straightforward nor terminal

(Source: Scheuer, 2007)

As Scheuer's figure shows, the still-evolving construction practices involved in green building is a constantly moving target (Scheuer, 2007). Scheuer states that exactly what or how a builder needs to learn about green building can be hard to determine, resulting in hesitancy in adoption among builders.

From sustainable development to green housing in more recent research, literature shows an increase in adoption rates among low-income housing providers and owners across the country (Fuhry and Wells, 2013). According to Fuhry and Wells (2013), sustainable development and green building standards are fluid by definition. As a basic definition for the purpose of this research, literature provides an overview of green housing as *a high-performance home with respect to its energy use and a healthy home regarding its indoor air quality* (Laquatra et. al., 2008). With the field of green building only emerging a little over a decade ago, green housing and construction has gained substantial ground over the past eleven years, particularly among the low-income housing community (Fuhry and Wells, 2013). Though it began with little national consensus on a clear definition coupled with blurred standards and unclear qualities necessary for its practice, green building standards have now become broadly recognized across the United States, though inconsistencies are still present (Fuhry and Wells, 2013). In 2011, nearly 17% of total residential construction in the country involved a third-party green building certification program as part of construction practice, showing a growing adoption of not only green building standards but also the verification programs providing green certification (Fuhry and Wells, 2013). See Figure 2.2 below.

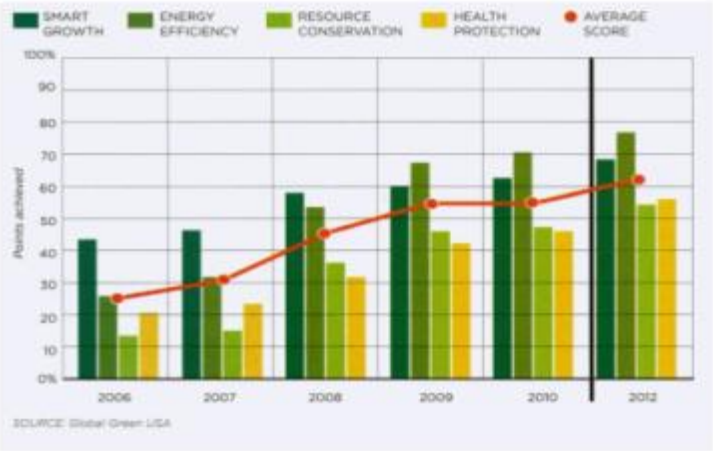


Figure 2.2. Growth in Green Building Standard Adoption in Low-Income Housing *(Source: Global Green USA)*

Thus, the low-income housing community has experienced substantial growth in green building standard adoption by means of third-party certification programs on a national spectrum since its beginnings over a decade ago. However, certain parts of the country are slower to adopt than others. Southern states, in particular, seemed to have had a slow start in green building standard adoption (Beatley, 2008). Of those states, Mississippi presents great opportunities for green, low-income housing adoption growth with persistent poverty percentages by county leading the country and little green low-income housing adoption (USDA, ERS, 2014).

2.3 Innovation and its routinization

Through Dalgish and Newton's studies, literature on innovation of all types is substantial, encompassing many different topics and categories primarily centered on innovational patterns and their diffusion (Dalgish and Newton, 2002; Burns and Stalker, 1961; Kanter, 1988). One such pattern of innovation relevant to this research is known as *routinization.* When a certain technology or procedure successfully fulfills its intended

purpose in a project, it undergoes the process known as routinizing. Routinizing takes place when an innovation has become incorporated in standard, regulated procedures and activities of an organization and, therefore, has lost any separate identity outside its incorporation (Rogers, 2003). Within the construction industry, routinization has been observed for green innovations over a period of time for organizations (Langar, 2008; Langar and Pearce, 2011). In this process, collaboration, partnership, and shared responsibility between innovation actors are crucial (Hines and Marin, 2004). Rogers (2003) states that a presence of a champion also facilitates the adoption of an innovation. Rogers defines a champion as *a charismatic individual who throws his or her support behind an innovation, thus overcoming the indifference or resistance that the new idea may provoke* (Rogers, 2003). This individual does not have to be a powerful leader in an organization, although often this is the case. Even lower-level individuals inside an organization capable of coordinating others' actions make effective champions of the innovational process (Rogers, 2003). Similar to the idea of the collective innovation decision already mentioned, the more passion at play in the innovation process, the more probable sustainability and eventual routinizing become.

2.4 Nonprofit organizations and low-income housing

The structural affordability crisis of the affordable housing environment has proven to be more challenging with time (Rase and Weech, 2013). Meeting the needs of low-income populations in the United States is no new crisis, and stabilizing the affordability of housing for such people in order to create better social and economic outcomes is a difficult task (Rase and Weech, 2013). However, despite the ongoing national struggle to provide housing respite for low-income families, non-profit

organizations (NPOs) have played a vital role in housing provisions to the low-income demographic (Rase and Weech, 2013).

The contemporary non-profit housing sector is essentially made up of two categories: community development corporations and national and regional non-profit organizations (Bratt, 2007). Thus, since this research is primarily focusing on NPOs within the State of Mississippi, the second category of the non-profit housing sector is most relevant to this research study. Given the established impact non-profits have on low-income housing provisions, non-profit housing within Mississippi will be addressed as the primary low-income housing provider.

2.5 Barriers facing nonprofit organizations

Graham (2012) in the article "Razing Lafitte" asserts the difficulty in defending housing from a hostile state. The author motions that advocates for non-profit housing charged with revitalization integration schemes in various communities containing government civil society conflict can expect challenging resistance from said society and state (Graham, 2012). Additionally, researchers have pointed that the residential construction industry has a relatively slow adoption clientele with a hesitant view towards green building products (Koebel, 2007; Ahn et. al, 2012). Furthermore, Koebel (1999) reiterates the housing industry as a long recognized resistance to change. In terms of constraints, Koebel points out the primary restraint of consumer demand, coupled with the challenge of building codes and code administrators (Koebel, 1999). Fueled by common belief of a sustainable society as radical innovation, Freeman and Soete rebut such a stereotype through their study, asserting that such innovation is more of an incremental *and* radical innovation for society at large (Freeman and Soete, 1997).

Though home construction is resistant to green implementation and sustainable development, Koebel advocates technological change as necessary to achieve sustainable, environmentally friendly buildings (Koebel, 1999; National Association of Home Builders [NAHB] Research Center, 1998).

While the push for greener, sustainable design is gaining prevalence in architecture as a whole, NPOs in the Southern United States seem to be generally exempt from such a mindset, focusing primarily on the conclusion and completion of each project (Drexhage and Murphy, 2010). In fact, studies show the implementation of sustainable development to be largely unsuccessful, revealing the world at large to have made little progress in program and policy implementation to improve the lives of the poor (Moyo, 2009). The amount of considerable time and effort necessary for the successful implementation of the three pillars of sustainable development is understood in the literature (Drexhage and Murphy, 2010), but efforts to implement sustainable development now are not disregarded or discouraged.

As to why implementation has not gotten past slow incremental steps into formative action, some offer a lack of leadership to be the cause. The World Business Council on Sustainable Development (WBCSD) argues that each sector waits on the others before taking action, limiting any substantial progress toward sustainable development. In addition to leadership deficiency, some developing countries blame lack of financial and technological resources for lack of sustainable development implementation. Many poor countries and populations do not have necessary access to technology, causing a severe lack in resources, infrastructure, quality of governance, and business environment vital for sustainable development to take place (United Nations

Economic Commission for Africa [UNECA], 2002).

In bringing sustainable development back to the NPO housing sector, there are common hindrances facing the NPO industry in implementing green, sustainable housing (U.S. Department of Housing and Urban Development, 2011). The first reason proposed for why NPOs avoid prioritizing green building strategies is the concept of higher initial building costs in green construction. The costs for environmentally low-impact materials and building systems tend to be more expensive initially in the construction process. However, cost-efficiency has been simultaneously achieved with green architecture and construction in the circle of non-profit organizations, proving the ability to adapt and revolutionize an outdated style of architecture. While other obvious obstacles are constantly present in the construction world, the lag of incorporating green design in the non-profit sector is a large hindrance in the overall movement toward more sustainable communities. University of Michigan's Hoffman and Henn examined the social and psychological barriers of incorporating green design and construction into project development, providing potential solutions to overcoming hindrances (Hoffman and Henn, 2008). Hoffman and Henn's study provides research on a specific type of hindrance stemming from green architecture, proving helpful in piecing together the bigger picture of resistance at large and the many genres such struggles fall under. Undoubtedly, there is much to be discerned about each type of resistance in the industry. Narrow pieces of research on specific branches of correlative interference in the industry help conglomerate the larger scheme of this present study.

Since Southern states have shown slower adoption tendencies in terms of green building standards, and Mississippi leads the nation in persistently poor counties, this

research targets low-income housing in the State of Mississippi offered by NPOs.

Research Questions: Hence, the research intends to answer the following research questions:

- What are the distribution trends of a major NPO operating in the State of Mississippi that also adopts green housing?
- What are the trends for green housing within the major NPOs in the state?
- What aspects set the affiliates that adopt green housing apart from the ones that do not adopt/implement green housing?

Thus, this thesis will identify the patterns for a NPO in the state. In addition, the study will identify the elements involved in green certification adoption into NPO housing in the State of Mississippi and analyze various aspects that account for the amount of green housing in the State of Mississippi.

Chapter 3 - Methodology

The preceding sections identified the need for conducting this research and the research questions associated. This chapter elicits the methodology utilized to address the identified research questions. Figure 3.1 in the following section depicts the overall research methodology for this study. Since the research dealt with identifying patterns for the non-profit organization (NPO) and the trends of green housing within the selected NPO in a real world setting, a *combined strategy design* was adopted. Robson (2002) recommends a *combined strategy design* approach for studies that are based on real world settings and where relevant work is sparse. In such a research design, the first phase is explorative and involves discussions with professionals from the industry (Robson, 2002). Based on the discussion with the members of the industry, the researcher obtained a list of NPOs in Mississippi relevant to the residential construction industry. This list was then subjected to pre-established constraints, eventually leading to the identification of one NPO that met all predetermined criterion for the study. The identified NPO was then subjected to a fixed design research approach. For this study, a cross-sectional design within the non-experimental fixed design strategy was adopted (Levin, 2006). Each of the phases have been discussed in the subsequent sections.

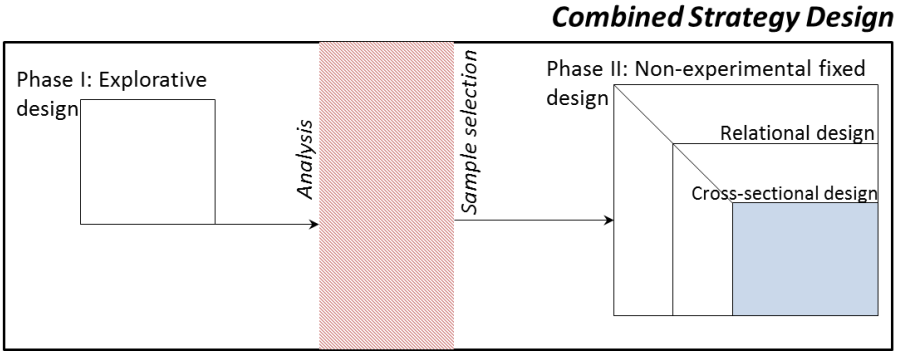


Figure 3.1: Overall Research Methodology

3.1 Phase I Explorative design

The main aim of Phase I of this study was to identify a NPO that qualified all pre-established criterion and could be used for analysis in the second phase of the research. For this purpose, it was imperative to identify all/most NPOs operating in the state, hence the use of an explorative design research method for this phase of research. In addition, the research method provided a better understanding of the profiles of various non-profit organizations (NPOs) operating in the State of Mississippi. The researcher had established multiple constraints prior to the start of the phase. These constraints helped in the identification of the NPO that could be subjected to the second phase of the research. The researcher conversed with various professionals in the industry and performed literature reviews to identify NPOs and their status operating in the state.

After identifying NPOs in the state, they were subjected to the following pre-established constraints:

- Availability of multiple affiliates across the state
- Willingness to share time, data, and be a part of the study
- More than one affiliate must have executed green projects across the state

After subjecting all the identified NPOs to these pre-established constraints, Habitat for Humanity (HFH) was identified as the NPO meeting the stated criterion in the state. The chosen NPO was then subjected to the second phase of the study where the researcher utilized a cross-sectional research design. The next section discusses Phase II in detail.

3.2 Phase II Cross-sectional design

The main intention of this phase was to identify the patterns and relationships between the variables within the shortlisted NPO. In order to identify such patterns and relationships sufficiently, a cross-sectional design was utilized. The researcher's reasoning for using such a methodology can be attributed to the following reasons identified by Robson (2002):

- Such a research design is focused towards identifying relationships between variables within a group. For the given research, the intention was to observe relationships between variables within the HFH.
- The ability to segregate the main group into sub-groups where required. In this case, the segregation would occur between non-adopters of green housing within the HFH.
- Ability to view the status of the HFH at the given period of time
- The most widely used method in the circles of social sciences

HFH has 38 active affiliates in the state. Survey methodology was utilized to obtain the data from the sample. The use of survey method for data collection has been identified by Robson (2002) as most effective in cross-sectional research designs. Figure 3.2.1 outlines all the steps incorporated in this phase.

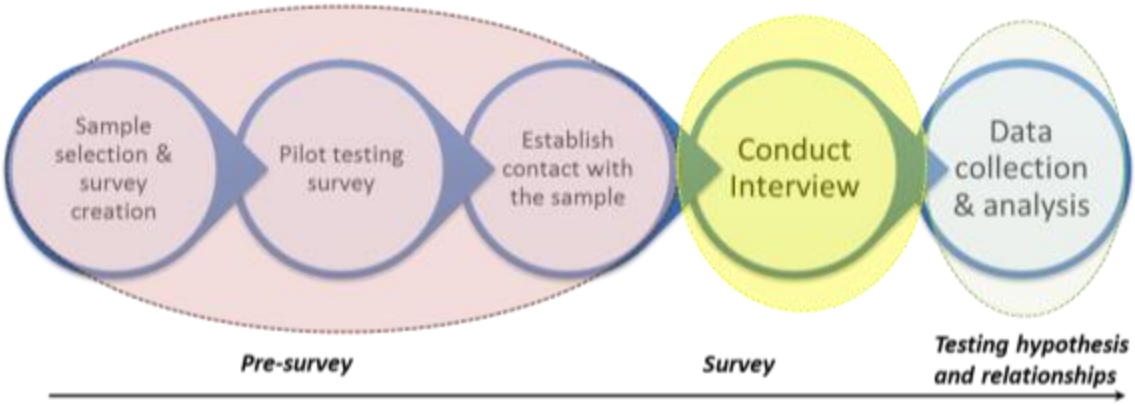


Figure 3.2.1: Research method for Phase II

Research methods for Phase II began with the creation of the survey. The survey was designed in order to obtain an overall picture of HFH in the State of Mississippi (including the adoption patterns of green projects) at the given period of time. The survey had seven different categories: demographic analysis, affiliate project analysis, affiliate goal analysis, green certification analysis, income analysis, routinization analysis, and barriers in innovation of green certification. All survey questions included variables that HFH affiliates would consider in day-to-day functioning. In addition, the researcher designed the survey to be completed within 50 minutes. After the creation of the survey, it was pilot tested by peers. After incorporating the recommendations from the pilot test respondents, the survey was sent to the Institutional Review Board (IRB). After obtaining an approval from the IRB, the survey was emailed to the sample. The e-mail addresses were obtained from a contact list on the HFHI website, where each affiliate in Mississippi was listed with corresponding contact information. In order to be considered a Mississippi HFH affiliate, each affiliate must be approved and recognized by Habitat for Humanity International as an affiliate in good standing. To be in good standing with the

national organization, each affiliate must complete at least one housing project per year, as well as adhere to standard HFHI affiliate regulations.

In order to obtain reliable responses to the interview questions, the researcher contacted affiliate employees knowledgeable about all aspects of the affiliate's design and construction processes. A total of 38 representatives (one from each affiliate) were e-mailed about this study and given an opportunity to participate in the researcher's survey. After the first round of e-mails, the researcher received confirmation of participation from 19 affiliates. A follow-up e-mail was sent to non-respondent HFH affiliates, after which six more affiliates responded, thereby increasing the total to 25. A final follow-up e-mail was sent to the remaining non-responsive affiliates but warranted no additional responses. At least 48 hours prior to the scheduled interview, each respondent within the sample was emailed an electronic copy of the interview questions. The researcher then conducted a phone interview on the scheduled day, during which all responses were audio recorded and stored on the researcher's computer. Upon the interview's completion, all responses were transcribed into an Excel worksheet for descriptive statistical analysis.

In addition to descriptive statistical analysis, content analysis of the data was also performed for questions relating to HFH affiliate goals**.** After obtaining each HFH representative's affiliate's goals, the researcher performed a content analysis of the gathered data by means of word frequency lists. By choosing this analysis method, the researcher hoped to identify each affiliate's greatest concerns by analyzing the most frequently used words in each representative's statement of goals (Weber, 1985). By analyzing the goals of each participating HFH affiliate representative in the state, the

researcher examined words used by the interviewee during the phone interview in order to determine if green efforts were present in said affiliate goals. If any mention of green efforts were included in an affiliate's stated goals, the researcher recorded it correspondingly in the data. This analysis was utilized in order to determine a relationship between green effort incorporation into affiliate goals and the adoption of green certification into affiliate practice.

Sections dealing with affiliate goal analysis, green certification analysis, income analysis, routinization analysis, and barriers in innovation of green certification were then segregated into two sub-groups. The two sub-groups were adopters of green certified housing and non-adopters of green certified housing. The researcher's reasoning for this segregation was based on the concept that the sub-groups represented two different genres of HFH affiliates. Thus, the combination of responses from two different genres could potentially skew generated results.

The next chapter discusses the results derived from the data analysis of this study.

Chapter 4 – Results

After statistically analyzing the data gathered from the phone interviews from each affiliate representative, the researcher was able to identify the trends for HFH within the State of Mississippi. In addition, the researcher was also able to identify relationships between variables in order to obtain an overall understanding of the distribution patterns for HFH in Mississippi. Furthermore, the research in the subsequent sections also discusses the adoption patterns for green certified housing, barriers for green certified housing, and routinization for green certified housing among Mississippi HFH affiliates.

4.1 Geographical analysis of all affiliates

The researcher examined the geographical distribution of all HFH affiliates across the state in order to observe geographical distribution patterns. In addition, this analysis also helped the researcher identify the counties that HFH was serving. Additionally, the researcher was able to pinpoint HFH affiliate placement according to county in order to compare affiliate placement with corresponding unemployment rates and poverty rankings for each Mississippi County. Figure 4.1.1 depicts the geographic distribution of the affiliates in the state. In addition, Figure 4.1.2 depicts that only 35 counties (43% of total counties) contained HFH affiliates, thus implying that the majority of the state, 57% of the counties, did not receive benefits from HFH activities in the state. This became evident when the researcher inquired if the affiliates served beyond the county lines. For most participating HFH representatives (roughly 67% of total Mississippi HFH affiliates), the response was negative. Further geographic analysis of the present HFH affiliates also revealed that about 42% of the persistently poor counties had the support of

HFH. These counties had 23% of the population living below the poverty line and an unemployment rate of 9%, whereas the 58% of the persistently poor counties that did not have any affiliate of HFH physically present were poorer. These counties had about 25% of the population living below the poverty line and an unemployment rate of 9.3%. This data will be further expounded upon later in the research discussion and analysis.

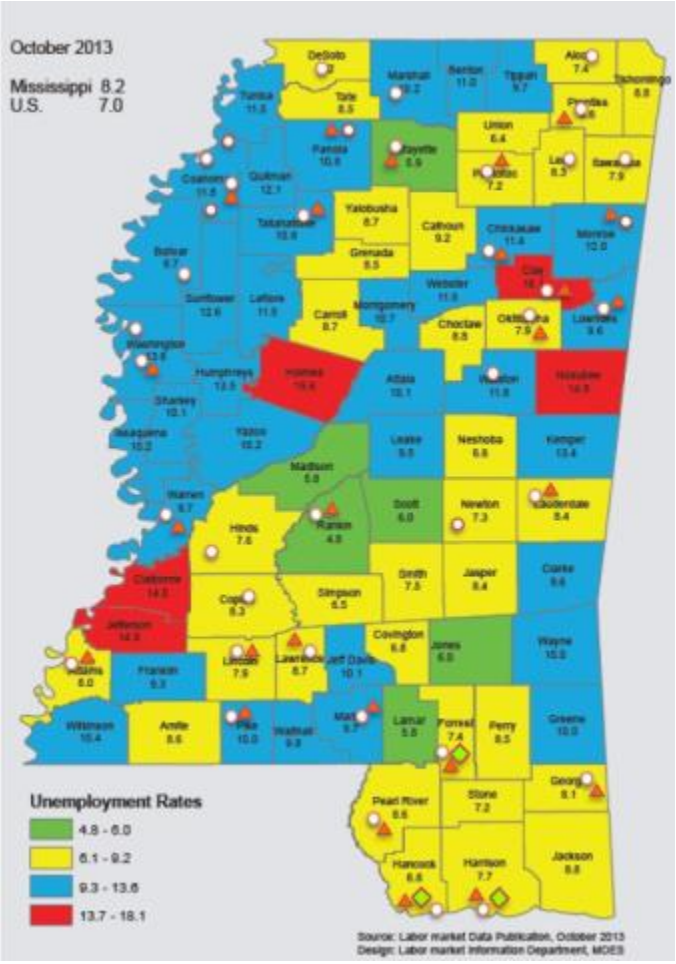


Figure 4.1.1. HFH Affiliate Distribution, Participation, and Green Certification Adoption

In the above shown figure, white circles distributed in counties containing a HFH affiliate(s) identify all HFH affiliates in the state. In addition, HFH affiliates that participated in the study have an addition of an orange triangle, and affiliates that

executed green projects have an addition of a green diamond beside them. Based on the data gathered and shown in Figure 4.1.1, the researcher was able to create Figure 4.1.2, in order to show percentage of counties containing HFH affiliates versus percentage of counties that do not contain HFH affiliates by means of a pie chart.

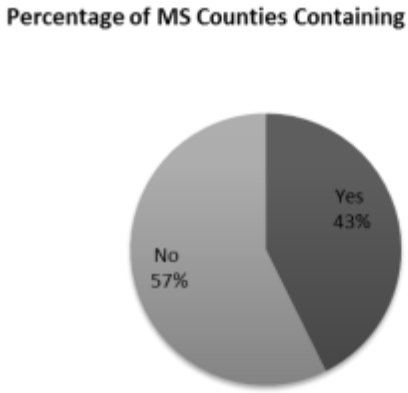


Figure 4.1.2. Percentage of MS Counties Containing HFH Affiliates

4.2. Demographic analysis of respondents

The figures in the subsequent section represent the demographic data gathered from participating HFH affiliates within the State of Mississippi.

Figure 4.2.1. Number of Paid Affiliate Employees

Figure 4.2.1 depicts the number of paid affiliate employees working for all participating HFH affiliates in the state. Out of 25 participating HFH affiliates, 15 affiliates identified one to five full-time (paid) employees, representing 60% of total affiliates. Second-most prevalent among state affiliates were completely volunteer-run affiliates, meaning that no paid full-time employees existed at such affiliates. Seven affiliates (28% of all participating affiliates) claimed that their affiliate was completely voluntary. Only two affiliates (8% of all participating affiliates) maintained more than 15 paid employees. Only one affiliate maintained between 11-15 paid employees, accounting for just 4% of total participating HFH affiliates. There were no HFH affiliates in the State of Mississippi that supported between six to ten paid employees.

In addition to paid affiliate employees, the researcher obtained data documenting the number of years in affiliate existence for each participating HFH affiliate as demonstrated below in Figure 4.2.2.

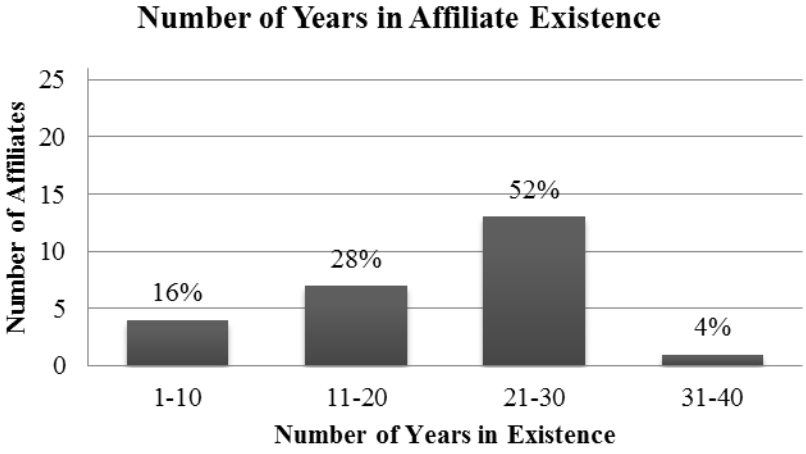


Figure 4.2.2. Number of Years in Affiliate Existence

The majority, 13 affiliates (52% of the participants), has been in existence between 21-30 years followed by seven affiliates (25% of the participants) being in existence for 11-20

years. The least was observed for the category of 31-40 years, where just one affiliate (4% of participants) was seen to have existed in the stated time span.

4.3 Affiliate project analysis

After compiling the demographic data into representative tables, the researcher collected data pertaining to Mississippi HFH affiliate projects. Following the standard order of interviews, the researcher gathered information pertaining to the affiliate project analysis interview question category to create tables that would accurately demonstrate the total number of project completions, the number of yearly projects completed, the types of projects completed, and the percentage of new construction projects completed for the total number of research-participating HFH affiliates.

Figure 4.3.1 depicts that 16 HFH affiliates (64% of participants) had executed between zero to 25 projects up to the time at hand. This was followed by three categories of affiliates that had completed 26-50, 51-75, and more than 100 projects completed from affiliate inception. Each category had three affiliates (12% of participants). The study also found that there were no affiliates with total project executions between 76-100.

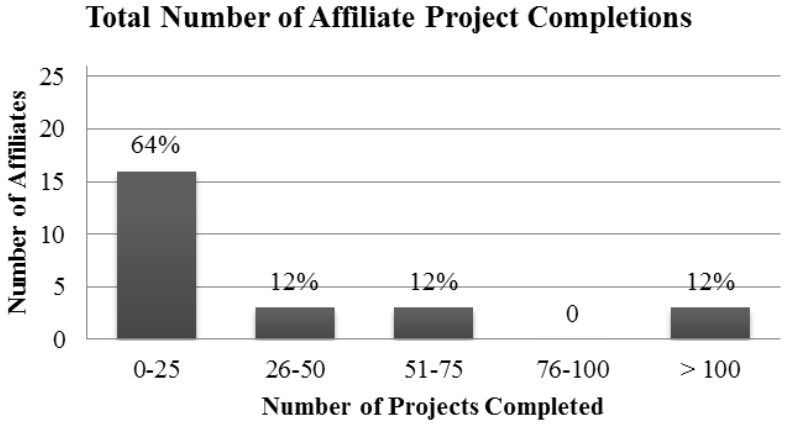


Figure 4.3.1. Total Number of Affiliate Project Completions

Figure 4.3.2 depicts total projects executed by each participating HFH affiliate on a yearly basis. Eleven affiliates (44% of participants) completed less than one project per year on average, implying that they would sometimes struggle to complete the standard one house per year, but were able to remain in good standing with HFHI through project grace periods. The same number of affiliates (11) also logged one to 50 project completions per year on average, accounting for another 44% of total participating HFH affiliates. The subsequent ranges of project completions of 51-100 and greater than 100 recorded two affiliates (8%) and one affiliate (4%), respectfully.

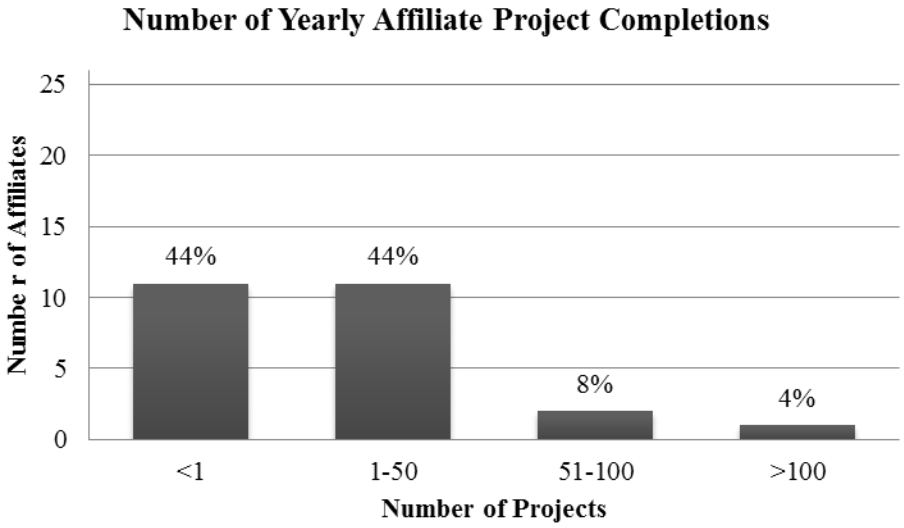


Figure 4.3.2. Number of Yearly Affiliate Project Completions

Figure 4.3.3 below depicts the type of projects executed by the HFH affiliates in Mississippi. A majority (88%) of the respondents identified only to have executed residential construction projects, totaling a number of 22 total participating HFH affiliates. The remaining 12% stated to complete both residential construction projects and projects outside the residential construction sector. This means that the stated 12% of

HFH affiliates participated in projects with other NPOs, commercial partnerships, and various other project types as a part of their yearly project completions. In other words, a total of three participating HFH affiliates stated to have completed both housing projects and projects outside of the typical HFH housing sector, including construction work with local businesses, partnering non-profit organizations, and various other community construction projects. Thus, the results indicate that the majority of HFH affiliates construct only residential projects.

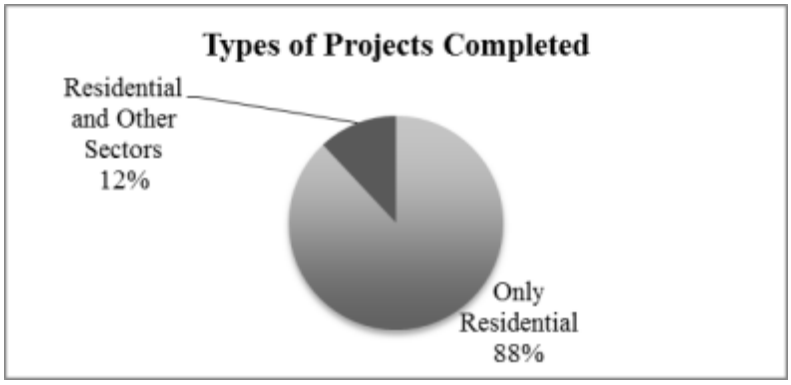


Figure 4.3.3. Types of Projects Completed

Of the projects completed by participating HFH affiliates, 16 (64%) of the respondents had 76-100% of their projects as new construction. This was followed by five (20%) of the respondents who had 51-75% of their projects as new construction. Only one affiliate claimed zero to 25% of its projects as new construction. Figure 4.3.4 illustrates the percentage of completed new construction projects executed by the corresponding number of HFH affiliates. Thus, the research indicates that the majority of projects completed by HFH affiliates in the state are new construction projects.

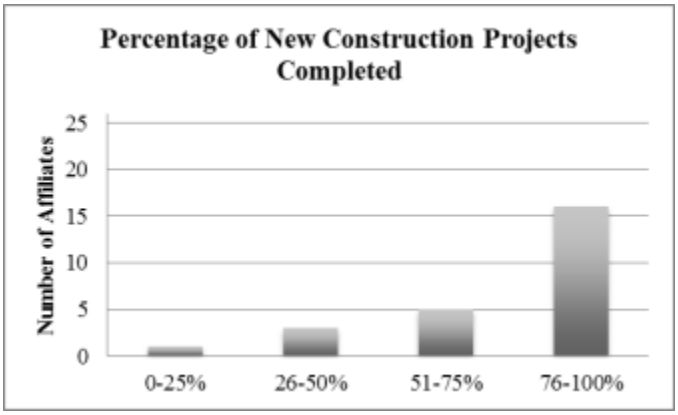


Figure 4.3.4. Percentage of New Construction Projects Completed

4.4 Green analysis

Following affiliate project data collection, the researcher proceeded to gather more information about participating HFH affiliate project completions through collecting data pertaining to projects that specifically involved green certification. After realizing the prevalence of new construction projects within HFH affiliate project completions, the researcher questioned interviewees about the percentage of new construction projects that obtained green certification. Figure 4.4.1 illustrates data collected from interview questions pertaining to green certification among those new construction HFH affiliate projects.

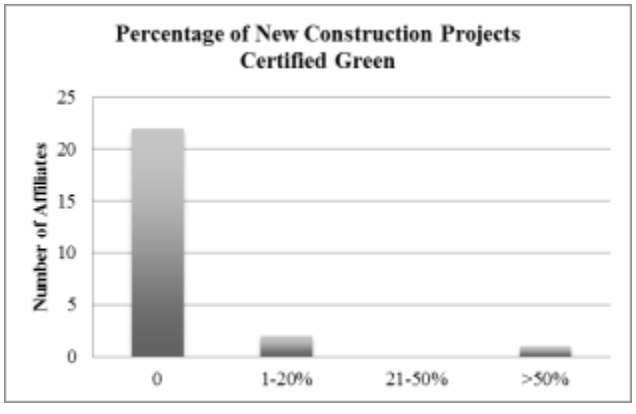


Figure 4.4.1. Percentage of New Construction Projects Completed

As the data displays, the majority of participating HFH affiliates had no certified new construction projects with green certification, totaling 22 total affiliates without green certification of any kind. Only two affiliates reported having between one to 20% of certified green new construction projects, while no affiliate claimed to have between 21-50% green certified new construction projects. Falling in the above 50% of green certified new construction projects was only one HFH affiliate that had incorporated green certification into 100% of new construction projects since 2009. Thus, the results uncovered only three participating HFH affiliates in the State of Mississippi that had certified green new construction projects of any kind.

Once research findings provided a limited amount of affiliates utilizing green certification into their new construction projects, the researcher proceeded to ask the affiliates using green certification which third-party benchmarks were most prevalent. In order to demonstrate affiliate representative responses, the corresponding data was compiled into Figure 4.4.2, shown below.

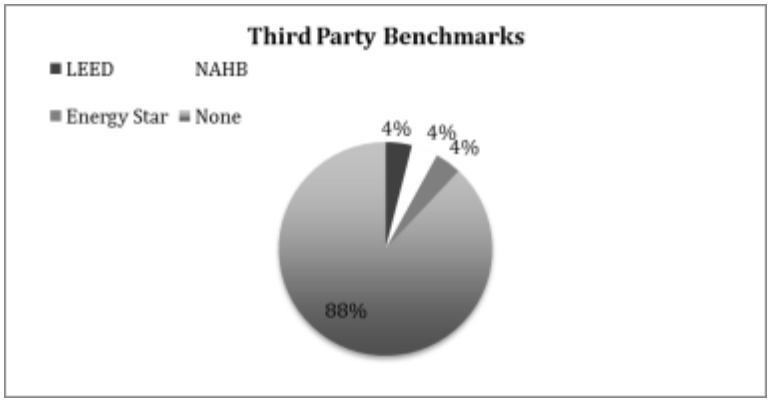


Figure 4.4.2. Third Party Benchmark

Of the three participating HFH affiliates that stated green certification to be present in their new construction projects, each had a different third-party benchmark that was most prevalent in their affiliate. As the pie chart in Figure 4.4.2 depicts, the benchmarks of

LEED, NAHB, and Energy Star were all utilized by the three affiliates using green certification. In order to represent all participating HFH affiliates in the State of Mississippi, the affiliates not using green certification of any kind are represented above by the "None" percentage, accounting for 88% of total participating HFH affiliates. However, the remaining 12% of HFH affiliates do incorporate green certification into their new construction projects, but each affiliate utilizes different third-party benchmarks for certification.

After recognizing a lack of green certification within participating HFH affiliate new construction projects as a whole, the researcher examined each interviewee's perception of green certification in order to gather information into how affiliates viewed the certification process. Figure 4.4.3 demonstrates the collected interviewee feedback.

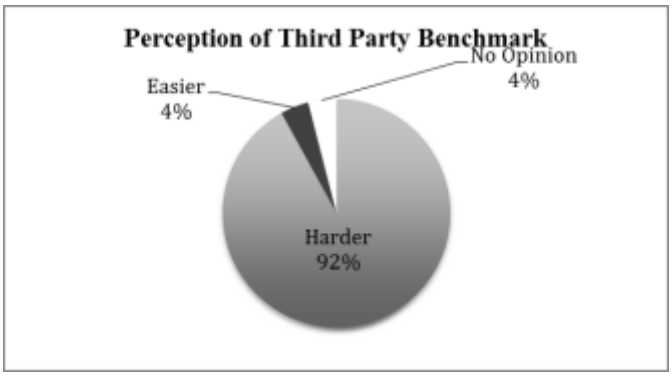


Figure 4.4.3. Perception of Third Party Benchmark

As the research indicates, most participating HFH affiliates recorded having a negative perception of green certification through third-party benchmarks, represented in the above figure through the "Harder" percentage. As shown, 23 of 25 participating HFH affiliates claimed third-party benchmark certification to be more difficult in the construction and post-construction processes as compared with projects without third-party benchmark certification. Only one affiliate (4%) claimed the certification process

as being easier, while one other participating HFH affiliate (4%) claimed to have no opinion on third-party benchmark green certification.

The existence of a change agent or champion for green innovation is also an important facet of green certification within HFH affiliates. The researcher asked all participating Mississippi HFH affiliates if there was any individual within their organization that would be considered a change agent or champion for green innovation, and the results are compiled below in Figure 4.4.4.

Figure 4.4.4. Existence of Change Agent

After recording three HFH affiliates as having completed new construction projects with green certification, the researcher found those same three affiliates to also possess change agents for green innovation, accounting for 12% of total participating HFH affiliates. Thus, three HFH affiliates claimed to obtain change agents for green innovation, while 21 affiliates (88%) stated to have no champion for the cause of green innovation. Following the examination of change agent existence, the researcher recorded results that gauged if participating HFH affiliates included green certification in their future affiliate goals.

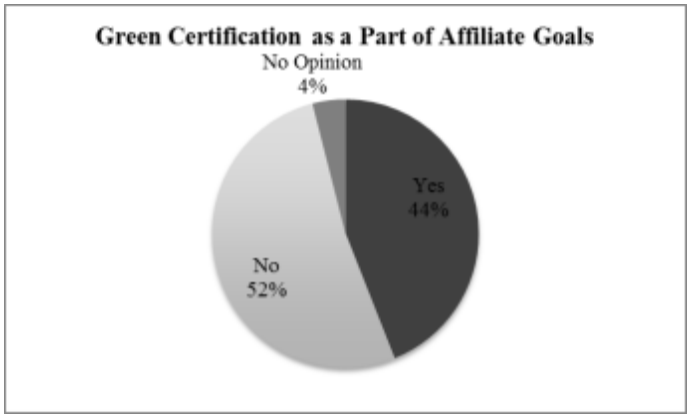


Figure 4.4.5. Green Certification as a Part of Affiliate Goals

As shown in Figure 4.4.5, results varied across participating HFH affiliates in the state. Thirteen affiliates (52% of total affiliates) claimed green certification to not be a part of their affiliate goals, 11 affiliates (44% of total affiliates) claimed green certification to be a part of their affiliate goals, and one affiliate (4% of total affiliates) claimed no opinion on the topic.

4.5 Affiliate goal analysis

When inquiring about information within the interview question category of affiliate goal analysis, the researcher sought to gain data representative of each affiliate, specifically. In order to keep the responses open, the researcher inquired about each affiliate's goals openly, allowing the interviewee to state his/her affiliate's goals as he/she wished.

Once all interviews had taken place, the researcher gathered the data in a way to demonstrate a difference between affiliates that incorporated green efforts into their affiliate goals as compared to affiliates that did not incorporate green efforts into their affiliate goals. The below figure illustrates the percentage difference between such affiliates.

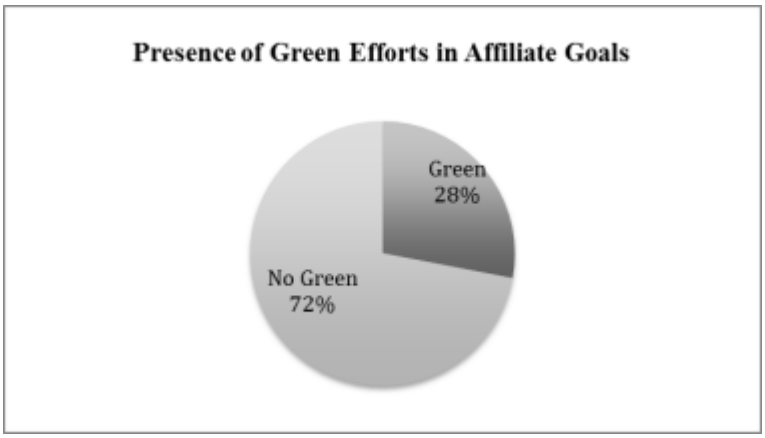


Figure 4.5.1. Presence of Green Efforts in Affiliate Goals

4.6 Income analysis

Following affiliate goals, the researcher moved into the interview question category of income analysis, where annual volumes (budgets) were obtained from each participating HFH affiliate in Mississippi. The corresponding volumes are displayed below in Figure 4.6.1.

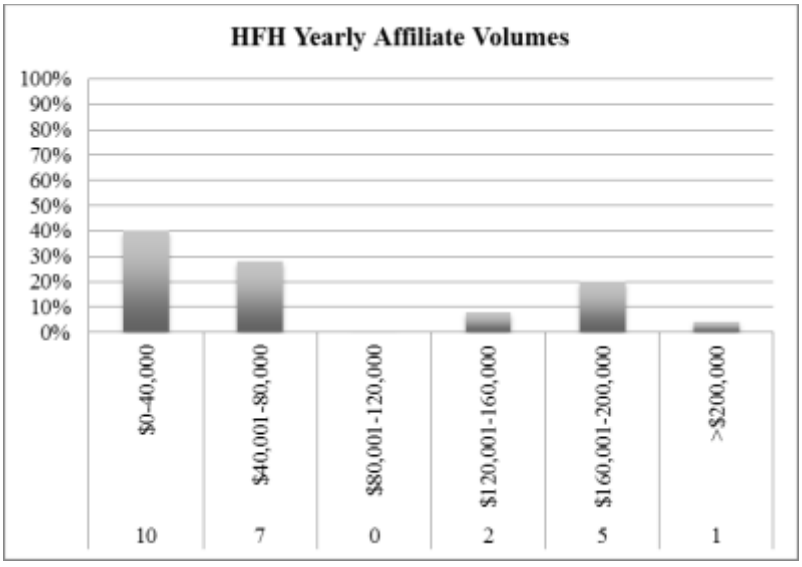


Figure 4.6.1. HFH Yearly Affiliate Volumes

As the above figure illustrates, 40% (10 affiliates) of total participating HFH affiliates registered an annual budget of $40,000 or less when questioned by the researcher. Second in prevalence, 28% (7 affiliates) of total participating HFH affiliates claimed an annual volume between $40,001-$80,000. No affiliates claimed a budget between $80,001-$120,000, while only 8% (2 affiliates) of total participating HFH affiliates stated a yearly budget ranging between $120,001-$160,000. Five affiliates (20%) claimed an annual volume between $160,001-$200,000, while only one affiliate claimed a yearly budget over $200,000.

4.7 Routinization analysis

In order to identify the process of routinization within Mississippi HFH affiliates that did incorporate green certification into the home construction process, all state affiliates were divided into three categories: 1) Affiliates containing green certification; 2) Affiliates using green building methods but not green certification; 3) Affiliates that had no green practices at all. Thus, in looking at the routinization of practices as it pertains to the repeated use of green certification, only the first group was considered when gathering data in the routinization interview category. When asking the three HFH affiliates that incorporated green certification into their home construction process about routinization, the researcher asked what unit of measurement was utilized to determine if a green strategy, material, or protocol would be repeated as part of the normal construction agenda. The following figure depicts the corresponding responses.

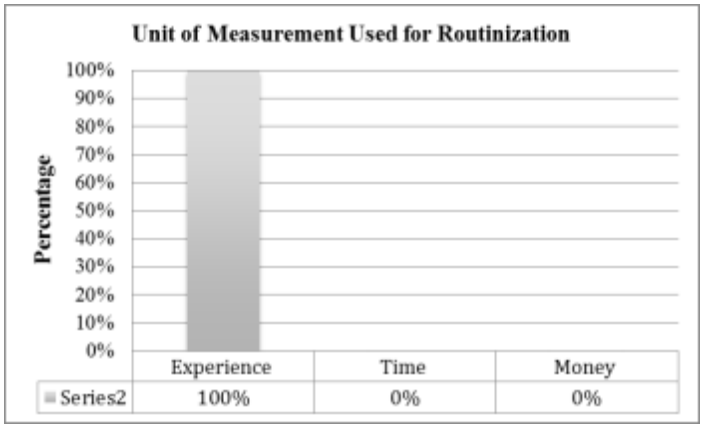


Figure 4.7.1. Unit of Measurement Used for Routinization

As the figure illustrates, experience of the green materials, strategies, and protocols in projects was the dominant unit of measurement utilized in determining future routinization. After securing experience as the tool necessary to determine routinization, the researcher proceeded to ask how many projects were considered to determine if a green material, strategy, or protocol was routinized in standard construction procedure. The interviewee was given three options of responses: less than five projects, between five and ten projects, and more than ten projects. Figure 4.7.2, shown below, demonstrates the responses from the HFH affiliates incorporating green certification into their home construction process.

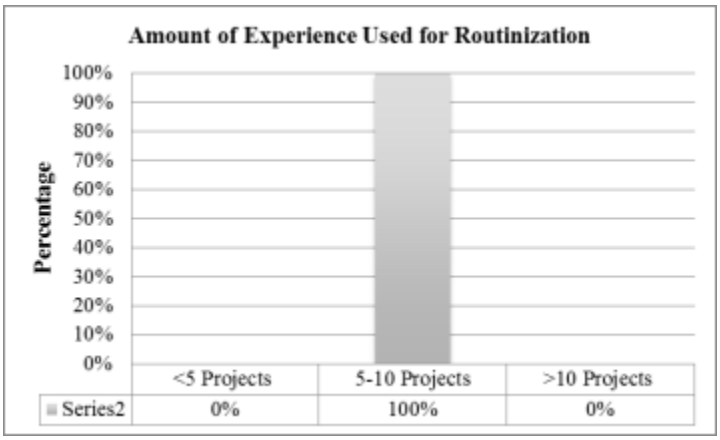


Figure 4.7.2. Amount of Experience Used for Routinization

Both affiliates registered that the amount of experience necessary in routinization or adoption of green materials, strategies, and protocols range between five to ten projects. In other words, green innovations are tested on five to ten affiliate projects in order to gauge their green impact on certification before being routinized as a part of standard construction procedure.

4.8 Barriers in Green Innovation

The last interview category executed by the researcher dealt specifically with barriers present in the adoption of green certification into HFH affiliate construction procedure. When asking about common hindrances in incorporating certification into their standard project agenda, the researcher asked each affiliate to respond openly in order to gain feedback into each specific affiliate's common barriers. After all affiliate representatives had been interviewed, the researcher compiled a list of common barrier response trends within the gathered data as it corresponded to each affiliate's response. Below, Figure 4.8.1 illustrates the recorded data by means of a pie chart in order to highlight the most common barriers in green certification adoption.

Figure 4.8.1. Barriers in Green Certification

As shown above in the figure, the factor of costs was the most common barrier reflected in HFH affiliates throughout the State of Mississippi, logging 38% of affiliate responses. Material accessibility claimed 19% of total affiliate responses, while affordability for families gained 12% of affiliate representative feedback. Ten percent of affiliate feedback for barriers in green certification was accredited to a lack of push for green certification within HFH affiliates. The category entitled "Other" consisted of various responses from affiliates that did not occur more than once or twice in the conglomerate data collection. This data was useful in identifying the biggest hindrances among HFH affiliates in the State of Mississippi in adopting green certification into standard affiliate protocol and helped explain what holds most HFH affiliates back from moving forward with green certification practice.

Chapter 5-Discussion

5.1 Introduction

This chapter outlines the third phase of this research project where the researcher used all results in order to draw conclusive findings, implications, and relationships among different components of Mississippi HFH affiliates. In addition, possible limitations and weaknesses to this study will be highlighted. The researcher will also identify several examples of potential future research topics relevant to this study and its relation to the non-profit residential construction industry.

5.2 Population density, poverty, unemployment rates and HFH affiliate placement in Mississippi

By using the US Census Bureau's map for population density in Mississippi, as well as a map showing poverty displacement throughout the state, the researcher was able to identify several relationships between population density, poverty, and HFH affiliate placement. When aligning all three facets, the researcher discovered that 13 out of the 15 poorest counties in Mississippi contained no HFH affiliate. In addition, the US Census Bureau's population density map from 2010 showed a certain relationship between more densely populated counties and HFH affiliate placement. See Figure 5.2.1 below for an illustration of HFH affiliate placement in accordance to population density.

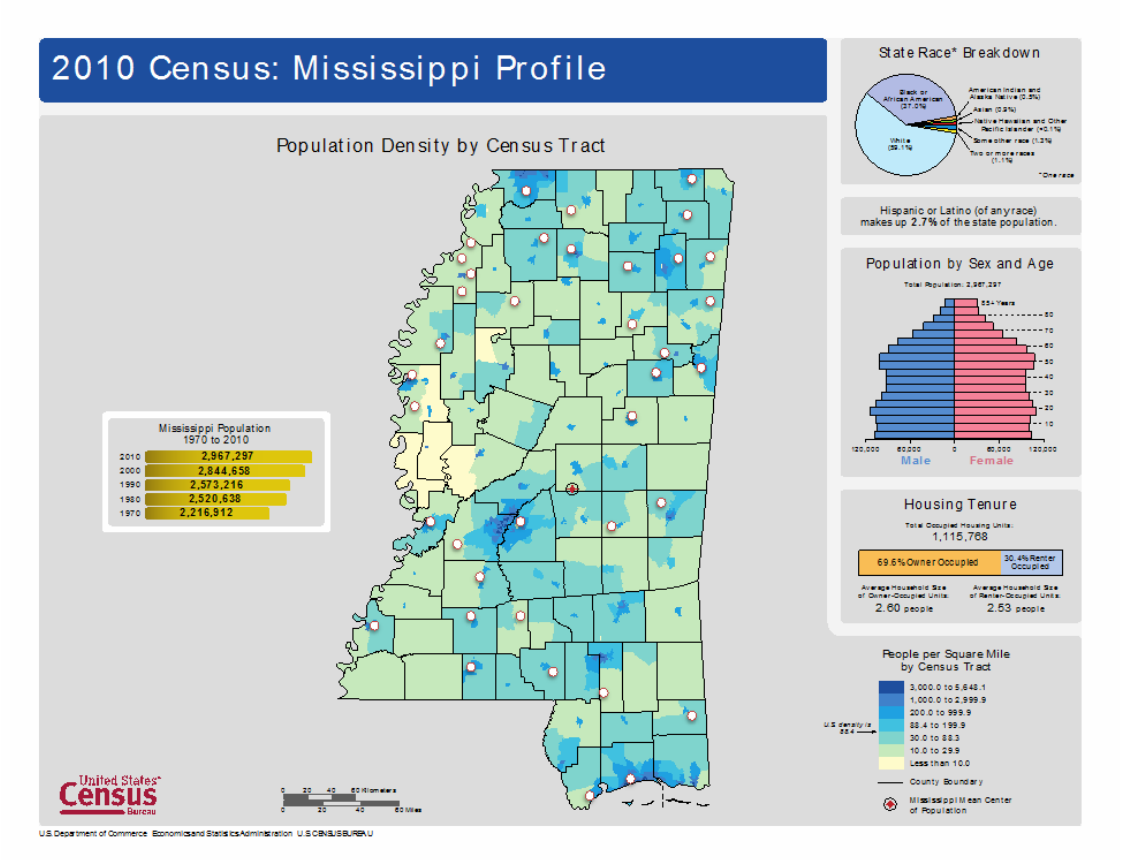


Figure 5.2.1 HFH Affiliate Placement vs. Population Density (Source: USCB 2010)

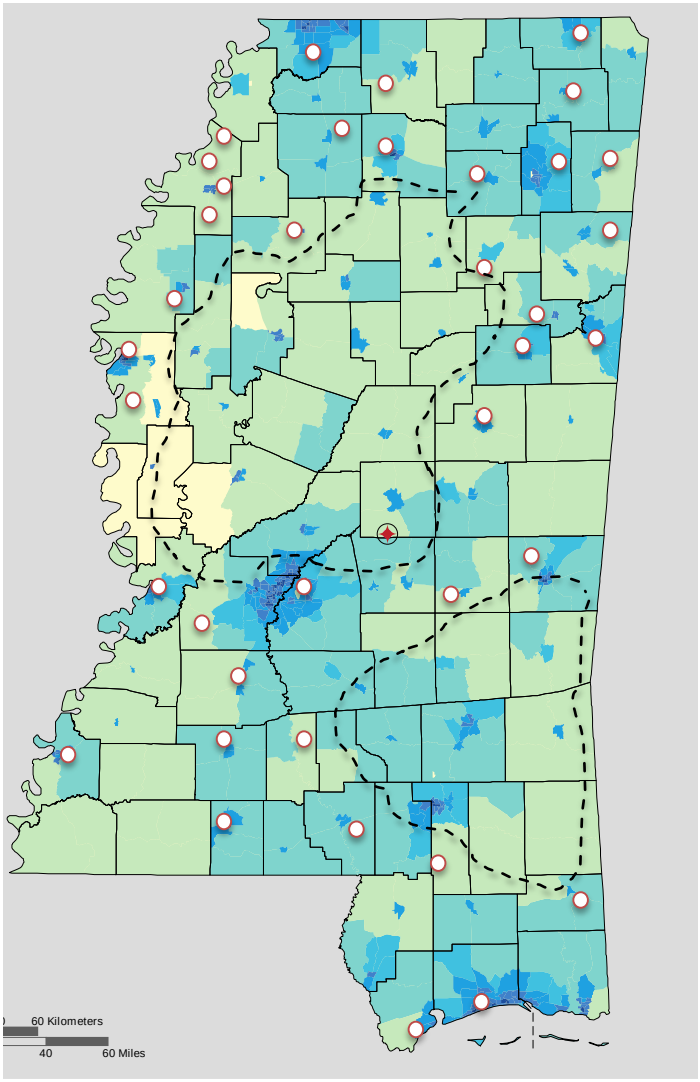
As mentioned briefly in the results chapter, counties with unemployment rates ranging from 9.3-13.6% contained the majority of HFH affiliate allotment (see Figure 4.1.1). Using these observations and findings, the researcher was able to conclude a tripartite relationship among population density, percentages of people below poverty line, and unemployment rates across various counties in Mississippi. However, in order to validate such a finding, a statistical analysis of the data is deemed necessary and can be a part of future research. As the population density increases throughout counties, the unemployment rates tend to decrease. Thus, there is a probability of a relationship between the amount of people living in a specified area and the job opportunities available in said specified area. In other words, people are more likely to live in counties

or areas equipped with more opportunities for employment, i.e., lower unemployment rates. Because families depend on employment for monthly and annual income, unemployment rates throughout Mississippi are especially important to the percentages of people living below poverty line. Thus, the higher the unemployment rates across counties, the higher the percentage of people living beneath the national poverty line in those corresponding counties.

As mentioned above, the majority of the poorest Mississippi counties do not contain any HFH affiliates within their borders. However, because of HFHI standard monthly mortgage partnerships with clientele families, the researcher believes HFH affiliates to specifically target low-income families experiencing inadequate housing conditions as qualified potential partners. Thus, the researcher indicates that although HFH affiliates target low-income clients, the *lowest* income and *most* poverty-stricken communities are not among such targeted populations. Because HFHI initiates partnerships with clientele equipped to pay a set monthly mortgage on their NPO housing, the researcher concludes that HFH affiliate placement aligns with HFH affiliates' intended efficiency. In other words, HFH affiliates in the State of Mississippi should be located in counties containing low to middle-income families outfitted with the economic ability to partner with HFHI through monthly mortgage payments.

Although poverty is affected by unemployment rate, which, in turn, is affected by population density, the researcher determined poverty to be outside of Mississippi HFH affiliates' primary concerns. Although it contributes to the tripartite relationship among itself, unemployment rates, and population density, and helps create urgency in the NPO sector, poverty alone does not play a substantial role in Mississippi HFH affiliate

placement. Rather, population density and unemployment rates are more directly related to HFH affiliate placement than percentage of people living below the national poverty line (See Figures 4.1.1 and 5.2.1).



5.2.2. MS Affiliate Placement Gaps (Source: USCB 2010)

The above map shows the gaps in HFH affiliate placement throughout the State of Mississippi by means of dotted line clusters. While the clusters without affiliates are somewhat large, the researcher found the gaps to be explained by the targeted clientele of HFH affiliates. With negligible exceptions, the dotted lines in Figure 5.2.2 include

counties and areas with relatively low population densities (approximately 10.0-29.9 people per square mile), aligning with prior stated claims from the researcher about HFH affiliates' targeted clientele. Although the gaps seem to be clustered, the lack of HFH affiliates in the corresponding counties can be attributed to the lower population densities present in shown counties.

5.3 Affiliate Composition Analysis: Number of Projects, Number of Employees, and Types of Projects

In analyzing demographic composition of each HFH affiliate in Mississippi, the researcher was able to devise correspondent relationships between affiliate number of projects, number of employees, and types of projects as they pertain to innovation of green certification in HFH affiliates, creating another tripartite relationship module. Of the total 25 participating affiliates, three contained green certified housing of any kind. The researcher found a certain relationship between the number of employees (size of affiliate) and the number of projects completed by said affiliate. Thus, the larger the size of the affiliate, the higher increase in projects completed by said affiliate. In addition, the researcher also found the number of projects to directly impact the types of projects in which affiliates would partake. For example, the higher number of total projects, the higher the probability for an affiliate to participate in projects outside of the residential sector into other project sectors. While the researcher found a strong relationship between the number of projects completed and the amount of green certification present within the corresponding affiliate, the researcher discovered that number of projects first affects project types. The more projects completed by an affiliate, the more opportunity to branch out of just the residential NPO housing sector. Thus, through more project

sector opportunities (originally caused by a higher number of project completions), affiliates that participate in sectors outside of solely the residential sector tend to incorporate an impetus for more utilization of green certification within their construction agendas. Thus, a higher number of employees allow for a higher number of project completions, and a higher number of project completions allows for more opportunities to create green impetus not just in a housing project, but also in all construction sectors.

5.4 Impact of Change Agent and Routinization on Green Certification

As mentioned in the literature review of this study, the importance of participation from the whole is vital for successful routinization of green innovation (Rogers, 2003). In order to ensure higher probability of success in innovation, a change agent or champion of an organization can increase the prospect of innovation by increasing participation of the organization's whole from within (Rogers, 2003). Based on data collected through phone interviews with participating HFH affiliates in Mississippi, the researcher was able to draw conclusions tying the presence of change agents for green innovation with the presence of green certification. According to research results, 12% (three affiliates) of total participating HFH affiliates claimed to have a change agent for green innovation within their organization. That same 12 % also contained the only green certified HFH housing projects out of the 25 total participating HFH affiliates interviewed. Thus, the interviewer concluded the presence of a change agent for green innovation to be directly related to the rate of incorporation of green certification into HFH affiliate construction practice. HFH affiliates in the State of Mississippi are more likely to incorporate green certification into their project agendas when a change agent

for green innovation is able to increase green impetus and participation within his/her affiliate, affirming Rogers's claims outlined in the literature review.

In addition to identifying change agents for green innovation, the three above mentioned HFH affiliates also were questioned by the researcher in order to determine the unit of measurement utilized to gauge routinization. Because the researcher only asked HFH affiliates that did incorporate green certification into their construction procedure about routinization of green materials, strategies, and protocols, these three affiliates were the only participating HFH affiliates to contribute to these research findings. When given the options of time, money, or experience for a unit of measurement to determine routinization methods, all three affiliates claimed experience to be most important in routinizing green practices from project to project. Specifically, all three affiliates declared five to ten projects as the unanimous range for a green material, strategy, or protocol to be experimented with until deciding it would or would not be included in the affiliate's standard construction procedure. Based on these findings, the researcher found that all other participating HFH affiliates in the state of Mississippi that did not incorporate green certification into their home construction procedure possessed a yearly project completion rate lower than five to ten projects. In other words, outside the three already stated HFH affiliates that did incorporate green certification into their housing projects, no other HFH affiliate in the State of Mississippi contained a yearly project completion number greater than four. Thus, the researcher found that although experience was determined by the three HFH affiliates using green certification as the unit of measurement for routinization, more experience was first required by the remaining affiliates in order to give said affiliates the opportunity to

experiment with the routinization of green practices. In other words, the researcher claimed that if an affiliate's yearly project completion number was under the accepted five to ten project range for routinization measurement, the probability of that affiliate incorporating routinization of green materials, strategies, or protocols into standard construction procedure was substantially less as opposed to affiliates with more yearly project completions. Therefore, the researcher stated that routinization was an indicating component of green certification within Mississippi HFH affiliates; however, research also indicates that the lack of green certification within state HFH affiliates can be attributed to a lack of yearly project completions throughout all state affiliates. The researcher asserts that if the adoption of green certification is to be increased among Mississippi HFH affiliates, the yearly completion rate of said HFH affiliates must also increase accordingly.

5.5 HFH Affiliate Perception of Third Party Benchmark Certification

As already stated, three HFH affiliates in Mississippi incorporate green certification into their construction project agendas; however, each affiliate does so through the use of varying third-party benchmarks. The researcher gathered data that showed NAHB, LEED, and Energy Star to be the chosen third-party benchmarks of the three HFH affiliates that incorporate green certification into project procedure. Thus, no *one* certification benchmark was repeated among the affiliates.

In addition to finding varying third-party benchmarks, the researcher also polled all participating HFH affiliates on their perception of green certification as it pertains to the construction process. The researcher asked each interviewee if they perceived green certification to make the construction process harder, easier, or no opinion. Based on the

research findings showing 92% of total participating HFH affiliates perceiving green certification to be more difficult on the construction process, the researcher resolved a link between green certification perception and utilization. With most HFH affiliates throughout the state seeing green certification as a project component that would further complicate construction practice, the researcher claimed perception to be vital in green certification adoption. If perception is not changed to view certification as more beneficial than it is difficult, the researcher asserts increased green certification adoption to be a farfetched notion. Thus, according to the researcher, negative perception of certification results in a lag of adoption, while positive perception of certification would result in heightened certification adoption among HFH affiliates in Mississippi.

5.6 HFH Affiliate Goals and Green Certification

Although HFHI contains standard goals for all their affiliates, the researcher provided all participating interviewees from Mississippi HFH affiliates the opportunity to log their individual affiliate goals as they pertained to their corresponding affiliate specifically. With this opportunity, all representatives of HFH affiliates throughout the state had the opportunity to freely voice relevant goals retained by their affiliate to the researcher. After logging affiliate responses into an excel worksheet, the researcher then conducted a content analysis of all interviewee responses, specifically looking for any mention of green efforts intrinsic in each affiliate's ambitions.

After content analysis was completed, the researcher found a total of 28% (seven affiliates) of total participating HFH affiliates including green efforts in their affiliate goals. Within the stated 28%, the 12% (three affiliates) of total participating HFH affiliates that did incorporate green certification into their construction procedures were

also included. However, the other 16% (four affiliates) claiming green efforts in their affiliate goals consisted of Mississippi HFH affiliates containing no green certified projects. Thus, the researcher found no direct relationship between including green efforts in affiliate goals and the utilization of green certification within affiliate construction agenda. However, the above stated 16% of HFH affiliates that possessed green efforts within their goals but did not implement green certification did utilize green strategies, materials, and protocols within their construction agenda. Although the corresponding affiliates did not contain any certified construction projects, the whole of the 16% mentioned followed a green construction guideline of some sort in their projects. Thus, the researcher did find the inclusion of green efforts within affiliate goals to be influential in improving green implementation into construction practice. However, the researcher found no direct relationship between green efforts within affiliate goals and green certification.

5.7 Barriers in Green Certification for Mississippi HFH Affiliates

By means of a similar content analysis method used in affiliate goal analysis, the researcher also conducted an evaluation of affiliate feedback pertaining to common barriers that prevented the heightened use of green certification. By logging all affiliate responses into a Microsoft Excel worksheet, the researcher was able to perform an analysis of affiliate responses in order to generate data representative of the most common barriers in green certification faced by Mississippi HFH affiliates.

As the pie chart in the results section illustrates, the most common stated barriers in green certification implementation were among the following: certification cost, material accessibility, affordability for families, push for green certification, and another

category comprised of various other barriers. With 38% of total participating HFH affiliates claiming cost as the most common barrier in green certification, the researcher was able to note the majority of affiliates resisting green certification implementation simply for the hindrance of certification cost. In many interviews conducted, the researcher found certification itself to be less of a priority by affiliates not incorporating it into standard construction procedure. Rather, utilizing green materials and strategies in hopes of providing a greener finalized project was more of a priority than the legitimacy of certification. Thus, the researcher found cost of certification to be a deterrent for affiliates that incorporated green standards into construction agendas from taking the next step to green certification adoption.

Another barrier stated by total participating Mississippi HFH affiliates was the lack of push for green certification within HFH affiliates. After logging this information and performing a content analysis on affiliate responses, the researcher was able to link a lack of push for green certification with the lack of a change agent or champion for green innovation within HFH affiliates, as already stated in the relationship between presence of a change agent for green innovation and affiliate utilization of green certification. However, the researcher noted that ten percent of total participating HFH affiliate responses to barriers in green certification were attributed to the lack of push for said green certification. Given these research findings, the researcher was able to highlight an increasing awareness of the need for change agents within Mississippi HFH affiliates if green certification utilization is to experience a heightened adoption rate. Though only ten percent stated the lack of push to be a common hindrance in implementing green certification, the fact that such a lack of push and change agent was noted by Mississippi

HFH affiliates shows progress in identifying specific affiliate needs necessary for further incorporation of green certification.

5.8 Limitations, Errors, and Future Research

Through the research process, the researcher realized several limitations to the research. Although 25 Mississippi HFH affiliates participated in scheduled phone interviews conducted by the researcher, there are a total of 38 HFH affiliates throughout the State of Mississippi. Thus, the researcher was able to obtain a 65.79% response rate from the solicited target respondents. This served as a limitation in research findings due to a lack of higher participation and feedback by all Mississippi HFH affiliates. Although the researcher took strides in maintaining accurate and clean data, the possibility of human error is one to be noted. In addition, the participant selection process could have been blemished by incorrect contact information available from the HFHI website, as some affiliates never responded.

This research contains many future potential research topics in the NPO construction world. For example, further research into Mississippi HFH affiliate placement could emerge from this research study. Although the majority of counties in Mississippi have only one HFH affiliate, Coahoma and Washington counties contained more than one affiliate. Future research could examine why these two counties are exceptions to the majority trend in HFH affiliate placement throughout the state. In addition, a future researcher could examine exploration into affiliate project expansion area. Based on this research study, the researcher found most affiliates to partner primarily with communities inside their corresponding county lines. One could look into expanding target affiliate impact outside of just county lines in order to base affiliate

placement more on population density, poverty, and/or unemployment rates throughout the state instead of only placement by county. Also, in terms of green certification, many affiliates lacked a positive perception of green certification as it pertains to the total impact on monthly energy bills, healthy living habits, and conservation of local environment. Thus, future research could examine the effectiveness of the third-party benchmark certification process as it affects the green impact of a construction project.

Chapter 6-Conclusion

This project set out to identify and analyze a NPO in Mississippi providing green certified housing of any type in order to further evaluate trends in green certification adoption among NPOs that provide affordable housing to low-income families. After the researcher identified all relevant NPOs in the state and matched them with the set criterion utilized for this study, Habitat for Humanity was selected as the targeted NPO for analysis. Through the process of creating survey interview questions, advertising to HFH affiliate representatives via e-mail, and conducting the interviews via phone, the researcher was able to collect relevant data. Statistical analysis of the data was performed in order to identify relationships among different components of HFH in Mississippi. Analysis of the geographical distribution of HFH affiliates throughout the state showed a strong relationship between affiliate placement and population density, with a secondary tripartite relationship among poverty, unemployment rates, and population density. Data findings identified three out of 38 total HFH affiliates in the State of Mississippi to contain any sort of green certified housing projects and further concluded strong relationships to be present among the existence of a change agent, number of projects, number of employees, and types of projects with successful adoption of green certification. Routinization was also identified to have a strong relationship with green certification adoption. In addition, the researcher asserted that if a heightened adoption rate of green certification is to occur in Mississippi HFH affiliates, average yearly project completions performed by each affiliate must also increase in order to provide opportunity for routinization. Pertaining to perception of third-party benchmark certification, the researcher noted negative perception of certification to have resulted in a

lag of adoption, while positive perception of certification to have resulted in heightened certification adoption among HFH affiliates in Mississippi.

In addition to statistical analysis, the researcher also conducted content analysis in order to identify relationships between affiliate goals and successful adoption of green certification, as well as identify the most common barriers in NPO adoption of green certification. The researcher did find the inclusion of green efforts within affiliate goals to be influential in improving green implementation into construction practice. However, the researcher found no direct relationship between green efforts within affiliate goals and green certification. In terms of barriers in green certification adoption, the researcher identified the following as the most common among HFH affiliates in Mississippi: certification cost, material accessibility, affordability for families, no push for green certification, and another category composed of various independent barriers logged. These barriers were collected and stated as relevant to this study because they identify hindrances currently facing HFH affiliates in the state from further adoption of green certification. By identifying the most common barriers among HFH affiliates in Mississippi, the researcher hopes to highlight problem areas in the industry in order to focus more on breaking down such barriers to move forward in green innovation within the NPO community.

Several improvements could be made to this study. Response rate from HFH affiliates in Mississippi was 65.79%, meaning that the study is not representative of all affiliates in the state and leaving room for improvement to a more state-wide representative study. This research study provides ample opportunities into further research of this topic on a larger scale.

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Appendix A: Interview Questions

Goal/Objective:

- Understand the level of adoption of green housing by Habitat for Humanity International (HFHI)
- Identify the major 3rd party benchmarking tool used by HFHI affiliates
- Understand what makes certain HFHI affiliates adopt houses that are green
- Presence or absence of certain factors is important for execution of green housing
- Understand the barriers for the adoption of green housing among HFHI
- Identify factors perceived as important for routinization of green innovations

Interview Questions

1. Demographic Questions
   A. Name of the affiliate
   B. Affiliate location
   C. Number of employees (full time and part time)
   D. Years in existence
   E. Number of projects executed on a yearly basis
   F. Total number of projects completed until now
   G. What are the goals for your affiliate?
   H. What types of projects does your affiliate execute? (Residential, others?)
   I. What percentage of residential projects executed are new constructions?

2. What percentage of new construction residential projects is green?

3. Who designs new construction residential projects executed by your affiliate?

4. Does your affiliate follow any 3rd party benchmarking tool to evaluate the greenness of a new construction residential project(s)?
    a. If yes, what is the benchmark that your affiliate follows?
    b. If no, how do you establish if a project is green?
    c. Is the mentioned benchmark used to evaluate the level of greenness of all green projects?
    d. When was it decided to implement the above-mentioned benchmarking tool?
    e. Who decides on its implementation?

5. Does your organization have an individual considered to be a champion of green innovation? (Change Agent)

6. Who makes the decision within the affiliate, if new project is to be green?

7. How is the decision made, if new project is to be green?

8. What percentage of the times do you have to convince the potential buyer to implement a green project?

9. How do you convince a potential buyer to implement a green project?

10. What is the success rate achieved, with the methods utilized?

11. What are the main source(s) of income for your organization?

12. What is the annual volume that you can use to operate the affiliate?

13. Regarding green technologies and strategies, what is the unit of measurement to decide on the continuity of innovation routinize it (make it a regular part of the organization)?

    A. Time (years after which the project was completed)

    B. Experience of use over projects

    C. Amount of money spent over the use

    D. Others

    - <u>If time,</u> what time frame would you use to decide on the continued use of the green innovation?

      A. Less than 1 year

      B. 1-3 years

      C. 3-5 years

    - <u>If experience,</u> then after what number of projects would you decide upon continued adoption?

      A. Less than 5

      B. Between 5-10

      C. More than 10

- If amount of money, then after spending what amount of money on the innovation at hand would you decide on its continued innovation?

  A. None

  B. Less than $1000

  C. More than $5000

14. What are the barriers for the implementation of the green projects?

15. What are the major factors which determine that a new project to be executed by your affiliate can be green?

16. Does use of 3rd party benchmarking tool (LEED) certification make the construction process easier than the traditional process? (only if they do)

17. Is the use of green innovation through the LEED certification process compatible to your organization's goals

Appendix B: IRB Approval Letter

THE UNIVERSITY OF
SOUTHERN MISSISSIPPI

INSTITUTIONAL REVIEW BOARD
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Phone: 601.266.5997 | Fax: 601.266.4377 | www.usm.edu/research/institutional-research-board

NOTICE OF COMMITTEE ACTION

The project has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services (45 CFR Part 46), and university guidelines to ensure adherence to the following criteria:

- The risks to subjects are minimized.
- The risks to subjects are reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered regarding risks to subjects must be reported immediately, but not later than 10 days following the event. This should be reported to the IRB Office via the "Adverse Effect Report Form".
- If approved, the maximum period of approval is limited to twelve months.
  Projects that exceed this period must submit an application for renewal or continuation.

PROTOCOL NUMBER: **14020404**
PROJECT TITLE: **Greening Non-Profit Home Construction: An Analysis of Habitat for Humanity in Mississippi**
PROJECT TYPE: **New Project**
RESEARCHER(S): **Alex Doleac**
COLLEGE/DIVISION: **College of Science and Technology**
DEPARTMENT: **Architectural Engineering Technology**
FUNDING AGENCY/SPONSOR: **N/A**
IRB COMMITTEE ACTION: **Expedited Review Approval**
PERIOD OF APPROVAL: **02/10/2014 to 02/09/2015**